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TENTH ANNUAL REPORT OF THE DIRECTOR.

SUBMITTED TO THE TRUSTEES JAN. 11, 1899.

To the Board of Trustees of the Missouri Botanical Garden:

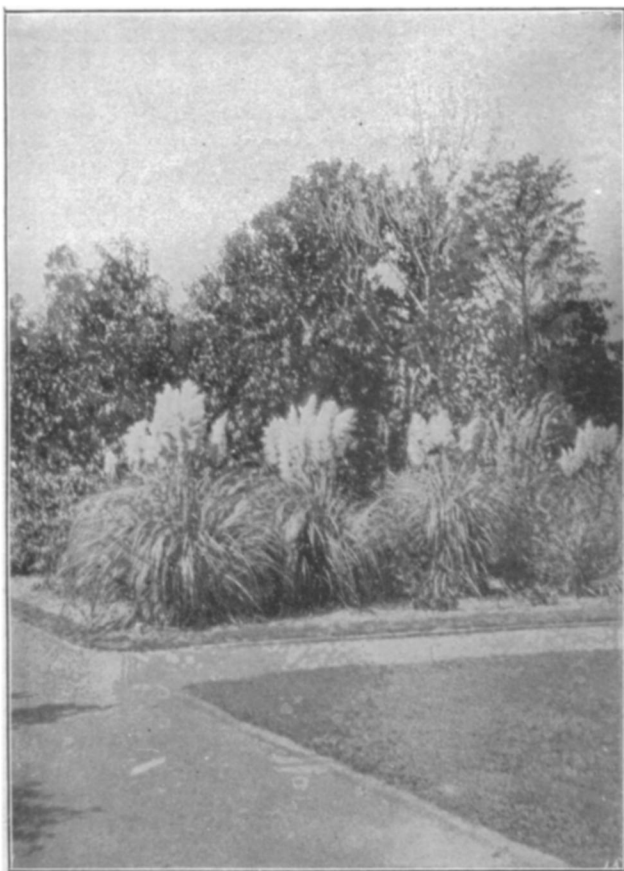
The following report on the Missouri Botanical Garden and the Henry Shaw School of Botany is respectfully submitted, in compliance with your rules. As this is the tenth report submitted since the organization of the Garden under the care of the Board, and therefore marks a convenient period in the history of the institution, it is made to include a resumé for this entire term.

THE BOTANICAL GARDEN.

Tersely stated, the objects contemplated by the founder of the Garden, as indicated in his will,* are, the maintenance of a garden easily accessible to the public, excepting on Sundays and holidays, for the cultivation, propagation and study of plants; the exchange of material; the equipment, maintenance and utilization of a museum, herbarium and library; the gathering about the institution of a corps of instructors and investigators, with suitable laboratory and instrumental equipment; the provision for public lectures, from time to time; the prosecution of research in botany in the broadest sense, including vegetable physiology, the diseases and injuries of plants, and horticulture, and other branches of science closely connected with these; and the instruction and training of gardeners.

In appointing a Director for the Garden, with the general duty of carrying out the provisions of Mr. Shaw's will, so

* Rept. Mo. Bot. Gard. 1 : 29.



PAMPAS GRASSES.

far as this could depend upon him, the Board of Trustees adopted a few simple rules for persons making use of the institution, and a comprehensive skeleton outline for the guidance of the Director.*

During the period covered by this report, the Garden has been kept open to the public at the times designated by the founder,† and has been maintained in as attractive a manner as the means at the disposal of the Board have permitted. While, as has been indicated in previous reports, year by year, the attractive features of the Garden have been annually augmented, the severe tornado of May 27, 1896 wrought great havoc with the trees, so that at the time, 450 trees were destroyed, and, as a result of the injuries that they then received, some hundreds of others have since died and been removed.‡

The plant-houses, which, when the Board assumed control of the Garden, were all of antiquated models and defective construction, from time to time have been placed in somewhat better condition; and the system of houses was increased by the addition, in 1894 and 1897, of a modern well-lighted house, a part of which is devoted to a collection of orchids, while another part is planted out, in a natural and attractive way, to ferns, cycads, etc.§ In 1895, a modern vegetable forcing house and grapery was added.|| Notwithstanding these additions, at present the house capacity is by no means adequate for the cultivation of the large number of species of plants which are now growing under glass, and, as has been reported previously,¶ it is hoped that ultimately very considerable additions may be made, in which case it should prove possible to set aside certain houses exclusively for bringing plants into bloom for display in other houses which are used exclusively for that

* Rept. 1 : 92. 8 : 12.

† Rept. 1 : 32, 51, 92. 6 : 11.

‡ Rept. 8 : 18. 9 : 18.

§ Rept. 6 : 14. 7 : 14.

|| Rept. 7 : 16.

¶ Rept. 8 : 37, 41.

purpose, while still other houses, as is the case with all at present, will be devoted to mixed collections, among which some plants are in vegetation, while others are in flower, all of the time.

Though the will of Mr. Shaw expressly indicates as desirable the extension of the grounds, from time to time, and the Board, some years since, placed the preparation of suitable extension plans in the hands of Messrs. Olmsted, Olmsted & Eliot, the well-known landscape architects, for the reasons stated in my last two reports* it has been impossible to begin actual work on the proposed extension, which is intended to include, in addition to smaller special groups, a permanent synopsis of the North American flora, representing the classification of Bentham and Hooker, and a permanent general synopsis of the higher groups of the vegetable kingdom, representing the more recent phylogenetic classification of Engler and Prantl.† Pending the receipt and adoption of the entire plans of the firm named, no considerable planting of trees and shrubbery in even the older part of the grounds is being undertaken.

The decorative features for 1898 were maintained on about the same lines as in previous years, and although, as is inevitable in a botanical institution, many species of plants which are of scientific interest but of no decorative value and only transient duration have been cultivated, an effort has been made to add to the permanent collection species of truly decorative value, both tender plants requiring shelter in the plant-houses and those capable of being used in the open air, either for bedding purposes or as hardy perennials requiring no special care to secure their continuance from year to year.

The collection of plants, which in 1895‡ was estimated at

* Rept. 8 : 46. 9 : 13.

† Rept. 8 : 39.

‡ Rept. 7 : 14. — The inventory showed 3,921 named forms other than annuals, of which 1,000 were supposed to be in cultivation in the year mentioned.

5,000 species and varieties, was found by a careful inventory then taken, to include, in 1898, 8,009 species and varieties, of which all but one or two hundred are named with more or less accuracy. Among the collections specially worthy of mention are the cacti, of which 462 species are cultivated (306 in 1895); the orchids, represented by 548 named forms (156 in 1895); the aroids, of which there are 274 species (93 in 1895); the ferns, including 169 species (84 in 1895); and palms, 61 species (65 in 1895, and, unquestionably because of the inclusion of other things, 106 in the administrator's inventory);* while of hardy trees and shrubs there are 1,811 species and varieties (862 in 1895), of hardy herbaceous plants 2,179 (1,129 in 1895), and of vegetables 1,016 (201 in 1895). Roughly divided, the collection includes 5,006 hardy forms and 3,003 cultivated under glass.

Though, because of the difficulty and expense of shipping plants and seeds from the United States to foreign countries,† it has been impracticable to make the duplicates of the Garden collections as useful to other institutions as would otherwise have been desired, an effort has always been made to supply material required elsewhere for cultivation or research; and under the new agreement of the countries comprised in the Universal Postal Union, it is hoped that in future the Garden can be far more useful than heretofore to its foreign correspondents, in supplying them with desirable seeds, cuttings and small plants. Each year, under the direction of the Board, the surplus bedding material on hand in the spring, after the grounds were planted, and many bedding plants, potted on the approach of cold weather, have been distributed to hospitals, missions and other charities, and the kindergartens of the public school system of St. Louis.‡

* Rept. 1:102.

† Rept. 7:16. 8:16.

‡ Rept. 4:13. 5:13. 6:14. 7:15. 8:16. 9:12.

In return for seeds and plants, and for its publications, a considerable number of consignments of plants are each year presented to the Garden,* and extensive but conservative purchases are annually made. During 1898, 274 such consignments were received, of which 225, including 4,597 plants or packets of seeds and valued at \$1,317.68, were presented. The expenditure for plants and seeds for the year was \$1,366.29. By way of exchange, 132 packets of seeds and 321 plants, appraised at \$111.80, were sent out; and 1,340 plants were presented to schools and charities.

Until midsummer of the present year, no definite count of visitors to the Garden was kept, the rough estimate of the gate-keeper and Head Gardener showing that there seemed to be a gradual increase in the number of persons who made use of the Garden in each successive year. Beginning with the middle of July of 1898, however, the gate-keeper has kept an accurate record of the visitors passing the gate, and his report shows 32,867 persons for week days during the period covered by the count. The smallest number, on the 21st of November, was 6. The largest number on any week day was 1,640, on October 6, which was the special holiday of the week of the St. Louis Fair. In June, on the Sunday afternoon when, in accordance with the provision of Mr. Shaw's will, the Garden was open to the public, 12,908 persons were counted, and on the first Sunday afternoon in September, when the Garden was likewise open to the public, under the same provision, 5,465 persons were counted. Estimating the number of visitors as approximately the same during the two halves of the year, it appears that the total number for 1898 may have been 89,102.

For reasons repeatedly stated in earlier reports,† the

* Rept. 4:12. 5:12. 6:14. 7:14, 16. 8:17. 9:12.

† Rept. 1:31, 35, 37, 50, 93. 2:25. 3:16. 8:19, 21. 9:16.

small museum which was established in the lifetime of Mr. Shaw, but which, when the Board assumed control of the Garden, was hardly in condition to be kept opened, is still used for other purposes, so that the Garden is yet without a public museum, although it possesses very considerable accumulations of research material properly classed as part of a museum equipment, though, from its nature, not displayed for public inspection. The extension plans already referred to provide for the ultimate establishment of an adequate museum.*

The herbarium, which started with the important Engelman and Bernhardt collections,† and which has been reported on annually, and to which, in 1897, were added the extensive Redfield, Jermy and Joor herbaria,‡ was increased during 1898 by the addition of many small collections from the United States and other regions, of which a very large number of specimens are still unmounted. The new material incorporated comprises, after deducting one duplicate sheet withdrawn from the Engelman herbarium and two from the general collection, 19,079 sheets of specimens, of which 7,103 were bought, 6,995 pertain to the Redfield collection, 2,475, appraised at \$123.75 were collected by Garden employees, and 2,506, appraised at \$125.30,§ were presented, chiefly in exchange for Garden publications. By way of exchange, 462 herbarium specimens, valued at \$23.10 were distributed to correspondents of the institution; and for research and museum purposes, 33 specimens of alcoholic material and 194 packets of nuts were presented to similar establishments.

* Rept. 8:43-4.

† Rept. 1:93. 2:24-5. 3:15. 8:19.

‡ Rept. 9:14.

§ These valuations, as in earlier volumes, for the unmounted specimens as received.

The present composition of the herbarium is as follows: —

Engelmann Herbarium (all groups), about..... 97,800 specimens.

The General Herbarium: —

Higher plants.

The J. J. Bernhardt Herbarium..... 61,121

The J. H. Redfield Herbarium*..... 11,506

Other specimens..... 114,965

187,592 “

Thallophytes.

The J. J. Bernhardt Herbarium*..... 126

Other specimens..... 21,942

22,068 “

Making a total of about..... 307,460 “

Valued at..... \$46,119 00†

The following, practically a part of the herbarium facilities, is essentially the same as for some years past:‡ —

Wood specimens of various sizes..... 1,027, valued at \$100 00

Wood veneers, by Spurr, Hough, Nördlinger,
and Michel..... 2,254, “ “ 155 00

Microscope slides, by Hough, Penhallow,
Munroe, and others..... 1,051, “ “ 250 00

Together..... 4,332, “ “ \$505 00

The library, which, when the Board assumed control of the Garden, contained the books and pamphlets of the late Dr. George Engelmann and a small but select collection of botanical works purchased at various times by Mr. Shaw, has each year grown in a gratifying manner, as has been

* So far as yet incorporated.

† The valuation of such collections is purely arbitrary, since they could not be exactly replaced for any amount of money, in case of loss; but they are now, by direction of the Board, reappraised at \$15.00 per hundred mounted sheets, — a more accurate valuation, for such as could be replaced by purchase, or for the estimate of building up a new herbarium of mounted material in case of loss, than the previous valuation of \$10.00 per century.

‡ Rept. 8:20. 9:15.

indicated in each of the previous reports.* During 1898, 260 books and 76 pamphlets were purchased, the total expenditure for the library, as shown by the Secretary's books, being \$1,731.76; and 427 books and 867 pamphlets, appraised at \$1,103.60, were presented or received in exchange for the publications of the Garden.

The manuscript index has been increased by the addition of some 62,248 cards. Of these an estimated number of 52,300, referring to the literature of field, garden and orchard plants, were presented to the Garden by the late Dr. E. Lewis Sturtevant, who personally attended to carefully packing them for shipment, shortly before his death, in July last; 4,365 cards, chiefly referring to the literature of the agricultural experiment stations and to new species and varieties of plants described within the last few years, were bought, and 5,583, largely referring to illustrations, were written by employees of the Garden.

As now constituted the library contains: —

Pamphlets.....	19,003		
Books (general).....	13,116		
	32,119	valued at.....	\$46,203 67
Books (Sturtevant Prelinnean Library)†.....	463	" "	2,315 00
MS. volumes (Engelmann and Roetter)	61	" "	700 00
Total.....	32,643	" "	\$49,218 67
Index cards.			
Various.....	192,385		
Sturtevant Index.....	52,300		
Total.....	244,685	" "	2,446 85
Total valuation.....			\$51,665 52

* 8:21. 9:15.

† The original number and arbitrary valuation of the collection presented by Dr. Sturtevant (Rept. 8:21). On the Prelinnean shelves are now found a much larger number of volumes than is indicated here, the accession and valuation of these, however, from year to year being included in the general accession lists and the valuation of the library as a whole.

In the summer of 1898, Dr. George J. Engelmann, who, for six years, until his removal from St. Louis, served as a member of the Board of Trustees of the Garden and who is still a member of the Advisory Committee of the School of Botany, and to whom the Garden is indebted for the presentation of the invaluable herbarium, library and manuscript notes of his father, the late Dr. George Engelmann, added to these gifts a large series of letters received at various times by his father from the leading botanists of the world. These, as well as a number of letters written by Dr. Engelmann which have come into the possession of the Garden in the same manner, are being preserved, and will ultimately be suitably mounted in bound volumes, to be added to the series of volumes of manuscript notes and sketches by Dr. Engelmann, to which reference has been made in earlier reports.*

As many additions have been made to the Sturtevant Library since the catalogue of this collection was published,† a supplementary catalogue of works published before 1753 has been prepared by Mr. C. E. Hutchings, for publication, if practicable, in the Tenth Report of the Garden.

So much of the result of Dr. Sturtevant's work on the literature of cultivated plants is now, by his own provision and action, preserved at the Garden, that, on my recommendation, the Board of Trustees have secured, through the kindness of Professor C. S. Plumb, of Indiana, who knew him well, the preparation for the Tenth Annual Report of a biographical sketch of Dr. Sturtevant, accompanied by an enumeration of his principal publications.‡ Though the actual equipment of a research institution speaks for itself, it is unusually gratifying to the Director and Trustees of the Missouri Botanical Garden to receive, in gifts like those from Dr. Sturtevant,§ the most direct

* Rept. 6 : 16.

† Rept. 7 : 123-209.

‡ Rept. 10 :

§ Rept. 4 : 14. 5 : 16. 6 : 16. 7 : 18, 123-209. 8 : 21.

and unmistakable of all expressions of approval of the lines along which their effort is being directed, and of confidence in their future actions.

In my last report,* reference was made to the preparation for publication of a general catalogue of the Garden library. The financial conditions which have caused a postponement of the inauguration of the plans for extending the grounds and plant-houses, and which have necessitated economy in adding to the scientific equipment, have also made it seem undesirable as yet to begin printing this catalogue, but as time has been found, the preparation of the cards from which such a catalogue may be printed has been continued, so that its publication will be possible whenever it is considered wise to incur the necessary expense.

The intention of the founder of the Garden that it should be developed into an institution for the promotion of the knowledge of botany, horticulture and allied sciences was recognized in the instructions drawn up for the guidance of the Director, by the Board, when they assumed control of the Garden;† and in appointing such assistants as have been necessary for the maintenance of the establishment, an effort has always been made to secure men who, while doing the necessary routine work, should be capable of devoting a part of their time to research. The principal results of such work, so far as published, were indicated in a list of publications contained in the Eighth Report of the Garden,‡ and it is hoped that a supplementary list, covering the years 1897-98, may be printed in the Tenth Report.§ I am gratified to be able to state that thus far the men who have temporarily occupied positions as assistants in the Garden, for the most part have removed to positions of greater botanical responsibility on leaving it.||

* Rept. 9: 16.

† Rept. 1: 94. 8: 44.

‡ Rept. 8: 221.

§ Rept. 10:

|| Rept. 8: 33.

Through 1898 the office staff remained as in 1897, except that the persons engaged on the library catalogue severed their connection with the Garden as soon as their work was substantially completed, while an addition has been made to the permanent staff by the appointment of Mr. C. H. Thompson as library assistant.

A practical necessity of every institution engaged in any considerable amount of research work is the issuance of a publication in which the results of such work may be embodied; and although it is not specifically mentioned in his will, the founder of the Garden, as is evident from certain manuscript suggestions found among his papers, contemplated the issuance, sooner or later, of such a publication by the Garden. In 1890, the Board, seeing the wisdom of taking a step of this kind, authorized the publication of an Annual Report, which, as now limited, is to contain the administrative reports of the officers of the Board and the Director of the Garden, and the results, so far as desirable, of such investigation as may be carried on by the Garden staff or under the influence of the Garden.*

No small part of the value of such a publication lies in its availability for library additions by means of exchange with the scientific establishments of the world and the publishers of journals. Two years since, a tabulated statement was prepared, showing that from 1890 to 1896, inclusive, an average of \$1,426.55 per year had been expended for publications of the Garden actually distributed up to that time, in return for which, from 1893 to 1896 inclusive (for which period records have been kept), herbarium and library material, in addition to that for which an equivalent had been given in herbarium material, had been received, appraised, on a low valuation, at an average of \$984.85 per year.† A re-examination, brought down to the end of 1898 (during which year a considerable number of back volumes of the Garden Report were distributed to

* Rept. 1:3. 3:3. 8:23.

† Rept. 8:25.

institutions which had not, up to that time, been on the regular mailing list), shows the expense of publishing and distributing the edition of 1,500 copies of each of the two Garden Reports printed since that statement was made to have been, — 1897, \$1,992.96;* 1898, \$1,690.30,† or \$3,683.26 for the 3,000 volumes printed (ignoring, as has been done elsewhere, separates of some of the component articles, in pamphlet form, the cost of which, however, is included in these figures). The total expenditure for publishing and distributing reports for the nine years, therefore, including reissues of the first three already referred to,‡ is \$16,708.30, or \$1,856.48 per year, and each of the 15,000 copies printed during this period has therefore cost a small fraction over \$1.11.

Since there remain on hand at the present time 2,066 copies of the Reports for future use, the total cost of those that have been actually distributed may now be set down as \$14,415.04, or an average of \$1,601.67 for each of the nine years covered by the tabulation in the Eighth Report and that here given.

As may be seen from my last report § and the preceding pages,|| the library and herbarium of the Garden were enriched, in 1897–98, by presented material valued (after deducting the value of exchange herbarium material sent out by us), on a low basis, at \$2,747.29, or an average of \$1,373.64 for each of the two years. The Garden, therefore, has been given herbarium and library material of a total appraised value of \$6,686.71, or an average of \$1,114.45 per year from 1893 to 1898, inclusive, for which period only records have been kept, and this may be regarded as a certain equivalent for the publications actually distributed. In addition to this library and herbarium material, the Garden has further received each year a considerable number of plants and seeds which have been presented by

* Rept. 9 : 10.

† Rept. 10 : 9.

‡ Rept. 8 : 24.

§ Rept. 9 : 14, 15.

|| Rept. 10 : 17, 19.

botanical gardens and other institutions. Up to the preparation of the Eighth Report,* this material was classed as having been received in exchange for Garden plants and seeds, the value of which, during a few years, considerably exceeded that of the receipts.† In point of fact, however, its value of late has been much in excess of the value of the plants and seeds which the Garden has distributed to its correspondents, and, as it has come, in large part, from botanical gardens which publish nothing excepting a small seed catalogue, from which they invite their correspondents to make selections, it may properly be regarded as replacing herbarium or printed exchange equivalents. In 1897,‡ the appraised value of presented plant and seed accessions was \$1,204.29, and of similar material given out, \$220.00, leaving \$984.29 which may properly be added to the herbarium and library additions received in exchange for Garden publications. In 1898,§ the corresponding material shows: accessions, \$1,317.68, distributions, \$111.80, leaving a balance of \$1,205.88 applicable in the same way. For these two years, therefore, it may be said that the average return for the Garden publications is properly \$2,468.72 per year. These results are especially gratifying because, while avoiding waste, the intention has always been to secure the distribution of the Garden Reports to permanent botanical libraries where they are likely to be of use, regardless of the receipt of any equivalent.||

In 1893,¶ the Board authorized the preparation of a small handbook, which might be placed on sale at the gate, at the approximate cost of publication, namely, twenty-five cents per copy. Eight copies of this handbook were given away and 192 sold, in 1898, making a total of 200 copies for the year, up to the end of which 2,362 copies had been disposed of, or an average of 393 for each of the six years 1893-98 inclusive.

* Rept. 8:17.

† Rept. 4:12. 5:12.

‡ Rept. 9:12.

§ Rept. 10:16.

|| Rept. 8:24.

¶ Rept. 5:17. 8:25.

As indicating the extent to which exchange relations have been established, I hope to be able to print in the Tenth Report a list of the periodical publications received at the Garden library, indicating, in an intelligible manner, those which are received in exchange for our own publications. From data obtained for the preparation of such a list, it appears that the periodical publications now received number 930, of which 840, issued by 660 institutions, and ranging in value from the bulletins of agricultural experiment stations, intended for gratuitous distribution within the States where they are printed, to the superb Annals of the Royal Botanic Garden, Calcutta, the last volume of which has a selling price of nearly \$50.00, are presented to the library.

In 1891, the only year when a statement on this point was published, 185 exchanges were reported.*

That the facilities accumulated under the provisions of Mr. Shaw's will might be utilized, not only by Garden employees, but by all competent persons, the Director was some years since instructed to issue, from time to time, a circular calling attention to these facilities, and, under suitable simple restrictions, offering them to professors of botany and others competent to carry on independent investigation at the institution.† From year to year the extent to which visiting botanists have availed themselves of the privilege so offered has been indicated to the Board, and material for the herbarium and library has always been freely loaned to responsible specialists.‡ Through a considerable part of 1898, one or more persons not in the regular employ of the Garden have occupied research tables here, one of them in the prosecution of work for the Doctor's degree in Washington University; and short visits to the institution have been made by a number of workers from a distance.

* Rept. 3:16.

‡ Rept. 7:19. 8:22. 9:17.

† Rept. 7:19. 8:22, 42.

As has been reported each year,* the expressed intention of the founder of the Garden that the instruction of garden pupils should not be neglected, has received the attention of the Board and the Director. One pupil, who would have completed his course in April last, was excused from further work in February and admitted to examination by the Garden Committee, that he might accept a desirable position, his certificate, however, being withheld until such time as he should have presented a thesis needed for the completion of his course. The vacancy created by his withdrawal was filled by the appointment of Mr. Ernest P. Field, a candidate nominated by the State Horticultural Society of Missouri; and with the beginning of the class year, in April last, Mr. Rudolph J. Mohr, of Omaha, Nebraska, was admitted as a paying pupil, under the provisions made by the Board. It is expected that in March next two pupils who are now in the fourth year will complete their work and receive the Garden certificates; and in anticipation of this event, a ninth announcement concerning garden pupils, comparable with those already issued, was distributed to individuals and the horticultural press, in November last. The course of study provided for garden pupils is the same as that already announced in various volumes of the Garden Report,† with the exception that this year one exercise per week in botanical geography has been added to the last trimester of the fourth year. The course, as now adopted, is indicated in the appended table.

* See, especially, Rept. 1:37, 94. 8:25.

† Rept. 8:30.

COURSE OF STUDY.

YEAR.	TERM.	STUDIES.					PER WEEK.
SECOND.	April to June.	Floriculture. 3 exercises weekly.	Economic Entomology. 1 exercise weekly.		Surveying. 2 exercises weekly.		6
	July to Sept.	Floriculture. 3.	Economic Entomology. 2.	Book-Keeping. 1.			6
	Oct. to Dec.	Floriculture. 1.	Economic Entomology. 2.		Surveying. 1	Elementary Botany. 3	7
	Jan. to Mar.	Floriculture. 1.	Twigs of Woody Plants. 1.	Orchard Culture. 1.	Landscape Gardening 1	Elementary Botany. 3	7
THIRD.	April to June.	Vegetable Gardening 4			Landscape Gardening 1	Botany of Wild Flowers. 2	7
	July to Sept.		Economic Mycology. 1	Orchard Culture. 2	Landscape Gardening 1	Botany of Garden Flowers. 2	6
	Oct. to Dec.		Economic Mycology. 3	Garden Accounts. 1	Botany of Fruits. 2		6
	Jan. to Mar.		Economic Mycology. 3	Garden Accounts. 1		Botany of House Plants. 2	6
FOURTH.	April to June.	Orchard Culture. 1	Forestry. 1	Book-Keeping. 1	Surveying and Drainage. 3		6
	July to Sept.	Small Fruit Culture. 4			Botany of Weeds. 1	Botany of Vegetables 1	6
	Oct. to Dec.	Special Gardening 2	Forestry. 1	Vegetable Physiology 2		Botany of Woody Plants. 2	7
	Jan. to Mar.	Special Gardening 2	Forestry. 1	Vegetable Physiology 2	Botanical Geography 1	Botany of Ferns. 1	7

The 77 class exercises per week here tabulated (each extending over three months), may be grouped under subjects as follows:—

Gardening:

Floriculture	8	
Vegetable gardening.....	4	
Fruit culture.....	8	
Forestry.....	3	
Landscape gardening.....	3	
Selected thesis work.....	4	30
	<hr/>	

Surveying and drainage.....	6	
Bookkeeping and accounts.....	4	
Economic entomology.....	5	

Botany in its relation to gardening:

General botany	8	
Botany of decorative plants.....	5	
Botany of hardy woody plants.....	3	
Botany of fruits.....	2	
Botany of vegetables.....	1	
Botany of weeds.....	1	
Botanical geography.....	1	
Economic mycology.....	7	
Vegetable physiology.....	4	32 77
	<hr/>	<hr/>

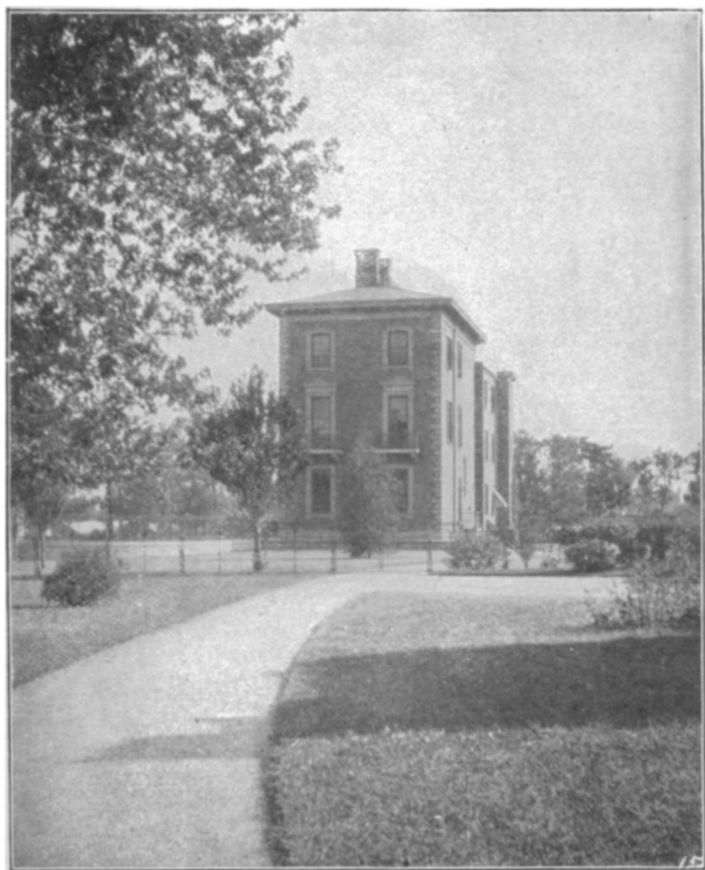
All of the subjects capable of being taught in the laboratory, the greenhouse, or the field, are so taught, and all of the theoretical instruction is expected to be practically tested in the performance of the manual work required of students, the object being to make practical gardeners and not botanists or other scientific specialists of garden pupils.

In addition to the matters directly connected with the administration of the Garden, the will of its founder provides for the removal of his city residence to the vicinity of the Garden;* the erection of a convenient residence for a curator of the mausoleum, the museum and the adjoining grounds;† and four annual events:‡ the preaching of a sermon “on the wisdom and goodness of God as shown in the growth of flowers, fruits, and other products of the vege-

* Rept. 1:43.

† Rept. 1:50.

‡ Rept. 1:49.



THE HERBARIUM BUILDING.

table kingdom;" a "banquet to the Trustees of the Garden, and to the guests they may invite, literary and scientific men, and friends and patrons of the natural sciences;" a "banquet to the gardeners of the institution, and invited florists, nurserymen, and market gardeners of St. Louis and vicinity;" and the award of "premiums or prizes to a flower show or exhibition, when such flower show may be established by amateurs and horticulturists of St. Louis."

The removal of the late city residence of Mr. Shaw, which was effected in 1891, and the utilization of this building for the administrative offices, the library and the herbarium, has been noted in earlier reports.* How this building, while retaining its distinctive character and present internal arrangement, may ultimately be connected with and utilized in the system of administrative and research buildings which will be developed about it, has already received the attention of the landscape gardeners, and in due time must be studied in detail by competent architects.

The provision of a cottage to be used as a residence for a person who should act as curator of the mausoleum, etc., received the attention of the Board in 1895, and has likewise been mentioned in the Garden Reports.†

The annual flower sermon has each year been delivered in Christ Church Cathedral, St. Louis, by a prominent clergyman of the Episcopal Church, and annually reported on.‡ In 1898, the sermon was preached on the morning of May 15, by the Rt. Rev. Leighton Coleman, D.D., LL.D., of Wilmington, Delaware.

The annual banquet to the Trustees of the Garden and their invited guests, on which a report has each year been made,§ has resulted in bringing the Garden in close touch

* Rept. 3:15. 7:7, 17. 8:19. † Rept. 7:7, 17.

‡ Rept. 1:103. 3:18, 21. 4:19, 23. 5:18, 23. 6:3, 17. 7:21. 8:34. 9:18.

§ Rept. 1:112. 3:18, 36. 4:19, 36. 5:18, 38. 6:17. 7:21. 8:34. 9:18.

with a considerable number of prominent investigators and educators through the United States and the adjacent British possessions. The banquet for 1898 was given at the St. Nicholas Hotel, St. Louis, on the evening of May 14. Dr. John Green presided. Sixty-four persons were present. The speakers were Dr. F. H. Snow, Chancellor of the University of Kansas, Rt. Rev. Leighton Coleman, Bishop of the Episcopal diocese of Delaware, Professor Conway MacMillan, of the University of Minnesota, and Hon. C. P. Walbridge, of St. Louis.

The annual banquet to the gardeners of the institution and invited florists, nurserymen and market gardeners,* has resulted in bringing together, each year, the most prominent workers in horticulture in St. Louis and a considerable number of active and distinguished horticulturists from a distance. The banquet for 1898 was given at the Mercantile Club, on the evening of November 19. Covers were laid for one hundred persons, among whom, in addition to the gardeners and office staff of the institution, and representative local horticulturists, were several officers of the State Horticultural Society of Missouri, the President-elect of the Society of American Florists, the Superintendent of Public Instruction of Missouri, the Superintendent of Instruction of St. Louis, and representatives of the horticultural press. The Director of the Garden presided, and Professor E. A. Engler, President of The Academy of Science of St. Louis, officiated as toastmaster. The speakers of the evening were W. N. Rudd, of Chicago, President-elect of the Society of American Florists; George B. Lamm, of Sedalia, Missouri, Chairman of the Committee on Horticultural Education of the State Horticultural Society of Missouri; F. L. Soldan, Superintendent of Instruction of St. Louis; L. A. Goodman, Secretary of the State Horticultural Society of Mis-

* Rept. 2:35. 3:18, 57. 4:19, 44. 5:18. 6:19. 7:21. 8:34. 9:18.

souri; Wilbur S. Jackman, Professor of Nature Study in the Chicago Normal School; Levi Chubbuck, Editor of Colman's Rural World; and John R. Kirk, Superintendent of Public Instruction of Missouri. The principal effort of the evening was concentrated on the discussion of a proposition to introduce the study of horticulture into the public schools, which was presented by Mr. Lamm and seconded by all of the speakers following him.*

In providing for annual premiums for a flower show or exhibition, Mr. Shaw's intention was obviously to stimulate the holding of horticultural exhibitions in St. Louis, at which the public might become familiar with the better class of plants suitable for decorative cultivation. Thus far, these premiums have been offered and awarded by the officers of an annual chrysanthemum show held under the auspices of the St. Louis Florists' Club.† In 1898, the premiums were awarded at the chrysanthemum show held in the Coliseum of the Exposition building, St. Louis, from November 8 to 12 inclusive. The classes of plants for which the premiums were awarded were essentially the same as in former years, excepting that a small part of the Shaw fund was this year used for premiums for native plants, represented by herbaria prepared and exhibited by the pupils of the schools of St. Louis and St. Louis County. The provision that could be made for this feature of the flower show, from the Shaw fund, was supplemented by a generous sum placed at the disposal of the Florists' Club by Miss Mary Lionberger, for similar premiums; and, although the exhibition of herbaria was less extensive than might have been wished, enough was done to show the feasibility of awakening an interest in our wild plants, not only in the public, to whom these flowers are presented in herbarium form, but among the pupils in the schools,—

* The proceedings on this occasion are reported in Colman's Rural World of December 1, 8 and 15, 1898.

† Rept. 5: 18. 6: 20. 7: 22. 8: 35. 9: 18.

results which have already been obtained in a similar manner, as well as by securing displays of blooming wild plants at various times through the season, by, for instance, the Massachusetts Horticultural Society.

To further secure the ends for which the premiums are offered, the Board of Trustees, in 1893, established a medal "to be known as the Henry Shaw Medal for the introduction of a valuable plant, and to be awarded each year, when practicable, for a new plant of value for cultivation, exhibited in St. Louis, as a part of the premiums or prizes to a flower show or exhibition provided for in the will of the late Henry Shaw; provided that the judges or other persons making awards at such exhibition shall certify that *said medal is awarded for a plant of decided merit for cultivation, not previously an article of North American commerce, and introduced to such commerce by the exhibitor during the year in which said award is made.*" * This medal has but twice been awarded: in 1893,† and in 1897.‡ On the occasion of each of the other flower shows, none of the plants exhibited were considered by the judges worthy of an award. It is hoped that, as time goes on, this medal, the award of which is intended to be restricted to really meritorious plants, may be the means of securing the early exhibition in St. Louis of plants which would otherwise make their appearance here at a considerably later date. It is to be regretted that the medal should have been so little sought for as yet, since in 1898, even, at least two plants were introduced to the American trade which were eminently worthy of receiving the award, and which it would have been perfectly practicable for the introducers to have exhibited in St. Louis in competition for it, — namely, *Acalypha hispida*§ (*A. Sanderi* of most floricultural writers) and *Dracaena surculosa*|| (*D. Godseffiana* of the trade).

* Rept. 5: 18, 19.

† Rept. 5: 19.

‡ Rept. 9: 19.

§ André, *Revue Horticole*. 70: 456. *pl.*|| Garden. 51: 298. *pl.* 1115.



THE GOOSE FLOWER.

THE SCHOOL OF BOTANY.

Some years before his death, in furtherance of his wish that botanical instruction and research should be pursued in St. Louis, Mr. Shaw endowed, as a department of Washington University, what is known as the Henry Shaw School of Botany, deeding to the University, for the support of this department, a piece of improved real estate in the business part of St. Louis.* In his will, made public after his death, Mr. Shaw refers to the purposes for which this gift was made (this portion of his will having been drafted, evidently, before the transfer was effected), and bequeaths to the University the endowment property already indicated, providing, further, that, in case of the depreciation of the property to an extent reducing the net revenue below a certain sum, the deficit shall be made up from the endowment funds of the Garden.†

At various points in his will, the founder of the Garden and School of Botany refers to the School of Botany, and indicates his intention that its relations with the Botanical Garden shall be very close, in such manner as to secure the co-operation of the two establishments, provision being made, even, for the increase in the means and appliances of instruction from time to time, when this may be expedient in the judgment of his Trustees.‡

In each of the annual Reports of the Garden has been incorporated a statement concerning the School of Botany, that in the First Report § being a quinquennial report of progress.

During 1898, the regular instructional force of the School of Botany remained as announced in my last report.¶ In addition to the courses given to undergraduates, resident work was provided at the Garden for one candidate for the Doctor's degree, during the early and the

* Rept. 1 : 56.

† Rept. 1 : 36.

‡ Rept. 1 : 37.

§ Rept. 1 : 84.

¶ Rept. 9 : 19.

closing months of the calendar year, and one other person was admitted to candidacy, under the rules of the University, in the autumn. Popular classes were conducted at the Garden by Miss Ellen C. Clark, of the Mary Institute, during the spring months. No considerable addition has been made to the equipment of the School as reported two years since,* and the courses of study offered as electives in the undergraduate department of the University remain essentially as at that time.

In furtherance of the intention of its founder, the School has always devoted as much attention as was practicable to the furtherance of investigation, both on the part of advanced students and of the instructional force. In the Eighth Report † was published a list of scientific publications from the School, including a series of nine "Contributions from the Shaw School of Botany." Since the publication of that list, three additional numbers of this series have appeared: 10, von Schrenk, Hermann. The Trees of St. Louis as Influenced by the Tornado of 1896. 11, von Schrenk, Hermann. On the Mode of Dissemination of *Usnea barbata*. 12, Pammel, L. H. The Histology of the Caryopsis and Endosperm of some Grasses.

As was noted in the Eighth Report,‡ it is a matter for congratulation that nearly all of the persons who have served as assistants or instructors in the School of Botany, have assumed responsible botanical positions on leaving it.

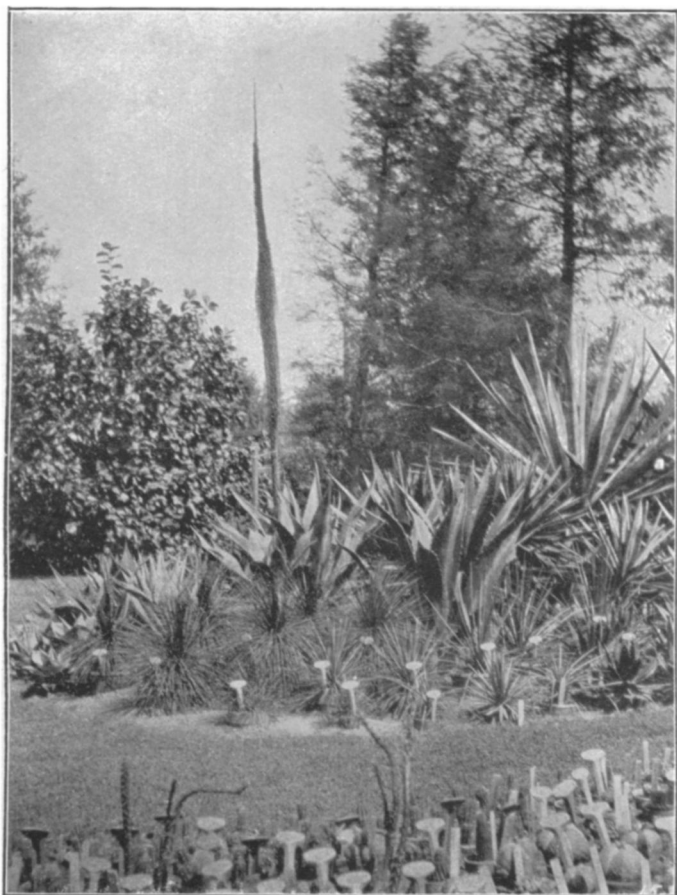
Very respectfully,

WILLIAM TRELEASE,
Director.

* Rept. 8:47.

† Rept. 8:229.

‡ Rept. 8:50.



AN AGAVE CORNER.